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STATE OF CALIFORNIA

Edmund G. Brown - Governor

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DIVISION OF FORESTRY
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THE RESOURCES AGENCY OF CALIFORNIA

William E. Warne - Administrator

DEPARTMENT OF CONSERVATION

De Witt Nelson - Director

FOREST FIRE REPORT

1961

DIVISION OF FORESTRY

F. H. Raymond - State Forester

Fire Control
Fire Prevention
Research
Development
Improvements

Cooperation
Personnel
Finances
Planning
Communications

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CALIFORNIA DIVISION OF FORESTRY

1961 FOREST FIRE REPORT

1. CHARACTER AND EXTENT OF THE FIRE SEASON

Measured by weather, fire occurrence, and acreage burned, the 1961 fire season was the severest the California Division of Forestry has experienced in over fifteen years.

When the winter and pre-fire season periods ended with below normal precipitation it was apparent that the State of California was to suffer from its third consecutive year of drought.

Generally, seasonal precipitation followed the previous year's pattern of increasing deficiency from north to south; that is, from slightly below normal in the northern portion of the State, values dropped to well below normal throughout the central part, to a parched 30 to 40 percent of normal in the southern section. In the south, some areas reported that it was the driest year in over one hundred years of weather history.

During the early spring months the southern portion of the State experienced a continuation of drought, while cycles of light rain and warm sunshine in the northern and central sections encouraged a heavy growth of grass. From all indications a very severe fire season lay ahead.

The summer started a month or so earlier; June and July were clear, dry and very hot. Temperature readings of 110 to 116 degrees were recorded in the interior valley and only the south coast and the higher mountain areas escaped readings of over 100 degrees. It was reported that northern California this year broke all previous records on the number of days of hot weather.

One heat wave in particular, about the middle of June, was so intense that most of the foliage on the oaks, buckeye, poison oak, toyon and chamise throughout the central part of the State were seared and blackened.

These dead leaves and desiccated areas of chamise along with the heavy crop of grass, which was completely cured by this time, added to the fuel mass and contributed to hotter burning, easier fire spotting and the development of fires of vicious intensity.

The months of June and July were the longest period of continuous "bad" fire weather during the ten month fire season.

The dominant weather feature for the month of August was the prevalence of thunderstorms. Fortunately, spotty precipitation and high humidities accompanied most of the thunderstorm-lightning activity and fires by this cause were of little concern.

September will be remembered for the very strong, dry, northerly winds that covered most of northern and central California during the Labor Day weekend. At lower elevations wind velocities were 25 to 30 m.p.h. with gusts above 50, and on the high ridges and peaks the winds were even stronger. Although of short duration, this was the worst weather during the 1961 season. Relief came on the 15th of September when the first real rain of the summer occurred, and by the 16th almost every reporting station from Fresno northward reported some precipitation. Red Bluff in the north enjoyed close to one inch, and some points in the Central Sierra almost two inches. The month ended, however, with a warm dry period which continued into October.

The weather pattern during October was quite variable. There were strong north winds on the 7th and 8th, a very hot spell from the 13th through 16th, and during the latter ten days, two weak Pacific fronts moved into and southward across the State.

Except for a few days of very strong "Santana winds" in southern California, there was little weather of interest in the rest of the State until the 19th of November. On the 19th, a migratory low center moved into the State, and the first heavy rain of the season began over the northern and central portion, spreading to the southern portions of the State the

following day. As the month ended intermittent rain in sizeable amounts was working its way southward, while considerable amounts of snow piled up in the Sierra and the northern mountains.

In summary, the fire weather during the 1961 season was characterized by drought, periods of abnormally high temperatures, persistent low humidity and fuel moisture, and much strong, dry, northerly wind. Weatherwise the season would be classified as worse than the two previous "bad" seasons of 1959 and 1960.

During 1961 there were 3,207 forest fires on those Zone I and II lands directly protected by the Division of Forestry. This figure, although the highest on record, is no more than might be expected upon examination of the facts.

First of all, in 1959 the Zone II area protected was increased by over six million acres, and with this increase in acreage the Division "inherited", on an annual basis, some eight hundred to one thousand additional fires. The second fact is California's phenomenal population growth. It has been statistically shown that the upward trend in fire occurrence follows the upward trend in population. The third cause of an increase in fire occurrence is the profound impact of several consecutive years of drought.

While everyone would prefer a reversal of the existing higher and higher fire incidence trend, it is quite obvious, and regrettably inevitable, that the Division has entered a new era: an era that has shifted annual forest fire occurrence from the two thousand category to the three thousand category.

Aside from this new plateau of fire incidence there appears to be no significant change in the other related factors. Monthly fire occurrence, fires by geographic location and the eight principal sub-causes under man-caused are all essentially the same as in previous years.

Lightning-caused fires continues to fluctuate from year to year. Although this year they were slightly above average it was not alarmingly

high. In 1961 the Division recorded 284 of this type fire as compared to 418 in 1960; 185 in 1959 and 222 as a ten-year (1951-60) average.

There were 87 of the major type fires (300 acres or larger) this year, as compared to 37 last year and 95 the year before. A dozen of these major type fires exceeded five thousand acres each, while three of the dozen were larger than twenty-five thousand acres each. These large fires may in themselves be pointed to as indicators of the severity of the season, a fire season that may well be called the worst in many years.

While it is the policy of the Division to strike all fires hard and fast with an adequate force, the Division has found it necessary during the last three years, and especially during 1961, to attack fires with much larger forces both at the start of a fire and during the control period. Also, patrols must be kept on duty longer after the fire is controlled than has been necessary during "normal" years. There is no doubt that this has produced the desired results because in spite of this being a bad year, the Division has been able to hold pretty close to previous years statistics in which 95 percent of all wildfire "starts" are controlled at less than one hundred acres.

Parallel with and resulting from the unfavorable weather and high incidence of fires, the 314,057 acres burned this year is the largest loss in some fifteen years. Although startling at first glance and unusual according to our present concept, the acreage burned this year is not statistically shocking; in fact, from a review of the past record it is what one might expect during a long term weather cycle of the current type. The records reveal that there were 303,400 acres lost in 1950, 510,000 acres in 1945, 425,600 acres in 1944, 385,500 acres in 1943, 356,100 acres in 1942, 401,400 acres in 1939, and 610,000 acres in 1936.

As the annals of 1961 are reviewed, the acreage losses during the months of July and September stand out as the most disastrous of the entire

season. During these two months some 240,000 acres were blackened and over 200 structures were destroyed. This is approximately 75 percent of the acreage burned during all of 1961.

Even though there was slightly more acreage lost during the month of July, the Division's fire control organization and supporting Conservation Camps were extended to the limits during September. Within the brief span of twelve days (September 3 to 14) fire control activities required the use of approximately 6,000 men and some 1,500 pieces of fire fighting equipment. Manpower included 1,500 Division employees, 2,500 inmates from the Conservation Camps and State Institutions, and some 2,000 others: including U. S. Forest Service, Lumber Companies and Logging Crews, Fire Districts, City Fire Departments, State National Guard, County Road Departments, Public Utility Crews and many, many other crews. Related support to the fire control effort was also given by the California Highway Patrol, California Disaster Office, County Sheriffs, U. S. Weather Bureau, Soil Conservation Districts and many other public agencies and private companies.

The following tables of statistics are provided for comparative purposes:

Annual Forest Fire Statistics on a Statewide Basis
Direct Protection Area - Zones I and II

<u>Year</u>	<u>Lightning Fires</u>	<u>Man-Caused Fires</u>	<u>Total No. Fires</u>	<u>Acreage Burned</u>	<u>Class E Fires (300 Acres or Larger)</u>
1951	301	1,858	2,159	148,360	79
1952	205	2,058	2,263	120,974	87
1953	151	1,932	2,083	125,150	58
1954	62	1,955	2,017	140,072	73
1955	140	1,801	1,941	161,488	61
1956	192	1,566	1,758	64,617	39
1957	91	1,895	1,986	124,316	70
1958	474	2,613	3,087	146,159	97
1959	185	2,982	3,167	147,658	95
1960	418	2,450	2,868	123,743	37
1961	284	2,923	3,207	314,057	87

Annual Forest Fire Statistics on a District Basis
Direct Protection Area - Zones I and II

<u>District</u>	<u>1961</u>	<u>Occurrence</u>		<u>1961</u>	<u>Acreage Burned</u>	
		<u>1951-60</u>	<u>% of Increase</u>		<u>1951-60</u>	<u>% of Increase</u>
		<u>Average</u>	<u>or Decrease</u>		<u>Average</u>	<u>or Decrease</u>
North Coast	687	582	+ 18.0	37,125	38,174	- 2.8
Sierra-Cascade	734	475	+ 54.5	73,390	17,840	+ 311.4
Central Sierra	729	510	+ 42.9	86,258	15,293	+ 464.0
San Joaquin	205	156	+ 31.4	55,908	10,639	+ 425.5
Central Coast	401	242	+ 65.7	51,977	25,639	+ 102.7
Southern California	451	369	+ 22.2	9,399	22,669	- 58.5
Statewide	3,207	2,334	+ 37.4	314,057	130,254	+ 141.1

Annual Forest Fire Statistics
All Clarke-McNary Lands in California

<u>Year</u>	<u>Lightning</u>	<u>Man-Caused</u>	<u>Total</u>	<u>Acreage</u>	<u>Class E Fires</u>
	<u>Fires</u>	<u>Fires</u>	<u>No. Fires</u>	<u>Burned</u>	<u>(300 Acres or Larger)</u>
1951	559	1,880	2,439	137,851	
1952	486	1,936	2,422	83,967	
1953	364	1,850	2,214	152,670	67
1954	127	1,866	1,993	104,488	62
1955	369	1,701	2,070	209,141	60
1956	520	1,607	2,127	87,868	47
1957	143	1,895	2,038	110,182	74
1958	750	2,359	3,109	163,918	82
1959	134	2,339	2,473	127,472	84
1960	553	1,820	2,373	106,933	29
1961	522	2,009	2,631	212,641	59

On all Clarke-McNary Lands throughout the State the 59 fires in the 300 acre or larger class burned the following acres by vegetation type:

Forested Lands	17,953 acres
Non-Forest	<u>180,335</u> acres
Total	198,288 acres

2. PROGRESS MADE IN EXTENDING PROTECTION TO NEW AREAS
AND ESTABLISHMENT OF BETTER PROTECTION IN OLD AREAS

A. New Areas:

No new area of Zone I was taken over for protection by the State during 1961.

B. Old Areas:

The Red Mountain Lookout in Del Norte County of the Humboldt Ranger

Unit was taken over from the Forest Service. It was first manned by the State beginning in May, 1961.

The 1961-1962 fiscal year fire control organization is as follows:

230 initial attack crews*	55 - #1
	37 - #2
	110 - #3
	22 - #4
	6 - #5
35 Patrolmen	
83 Lookouts (3 are manned by a Lookout-Patrolman on high hazard days)	
55 Initial Attack Bulldozer-Transport Units	

*With the adoption of the 1956 Fire Plan, the designation of crews changed from 4, 9 and 13 man crews to #1, #2, #3, #4, or #5 crew. The #3, #4, and #5 crews have 2 fire trucks.

- (a) #1 Crew: 1.5 foremen; 1 driver; 3 firefighters
- (b) #2 Crew: 1.5 foremen; 1 driver; 6 firefighters; 1 cook
- (c) #3 Crew: 1.5 foremen; 2 drivers (1 yearlong; 1 seasonal); 6 firefighters; 1 cook
- (d) #4 Crew: 1.5 foremen; 2 drivers (1 yearlong; 1 seasonal); 8 firefighters; 1 cook
- (e) #5 Crew: 1.5 foremen; 2 drivers (1 yearlong; 1 seasonal); 10 firefighters; 1 cook

C. Air Program

For the second consecutive year the Division's support budget included funds for the use of aircraft. The allocation of \$304,526 enabled the activation of 7 air tanker bases and 2 helitack bases with paid standby and flight time during the most critical part of the fire season; and, partially offset the use of aircraft from 8 other air tanker bases which were voluntarily manned by air tanker operators during portions of the season when they were not actively engaged in fire flying. Because of the severity of the season and the numbers of large fires, an additional amount of \$330,557 was expended from emergency funds for aircraft and helicopter rental.

Although the program was considered to be operational, evaluation of results were continued whenever practical.

The only program expansion above 1960 was a manned helitack base at the Badger Station in Tulare County. Although not used in initial attack on many fires, it was completely effective in control of one fire in a remote area which had the potential of a large fire. The helicopter and crew were also used effectively on large fires in District IV and V.

The following table is a partial analysis of three years of air tanker effectiveness for initial attack:

	<u>1959</u>	<u>1960</u>	<u>1961</u>
(1) No. of fires on which air tankers took action	153	153	199
(2) Gallons of retardant dropped	564,735	590,305	875,400
(3) Percent of fires in (1) on which crews were already taking effective initial attack action prior to arrival of air tankers	37%	30%	35%
(4) Percent of fires in (1) on which crews were not able to take effective initial attack prior to arrival of air tankers	63%	70%	65%
(5) Percent of fires in (4) where air tanker action permitted crews to begin effective control action	87%	89%	74%
(6) Percent of fires in (1) on which overall air tanker action was judged to be -- effective	66%	77%	75%
-- ineffective	7%	12%	10%
-- not needed	27%	11%	15%
(7) Percent of fires in (1) on which it was felt that air tanker action was responsible for helping to reduce final acreage	---	73%	73%

D. Fire Economics

The Fire Economics Study, contracted by the Division to the School of Forestry, University of California, continued a slow but certain

pace toward its goal. This goal is to provide criteria which the Division might use to determine what level of forest fire protection should be given to every acre of California's wild lands commensurate with the values involved.

Studies to appraise the kind and magnitude of economic values protected by the Division were limited in 1961 due to the general lack of qualified persons on the School of Forestry staff to perform such work. It is hoped that these appraisals will be resumed in the near future.

The School did forge ahead in two phases of the overall study: the possibilities of reducing overall costs of suppression-plus-damage through techniques of operations research and also through reducing the volume of flammable forest fuels in key areas.

One research specialist spent considerable time in the Division's North Coast District during the summer of 1961. He observed techniques of detecting and reporting forest fires and of dispatching crews to fires. He also observed suppression actions of fire crews, air tankers, and helicopters. Further steps in this phase of the study will be to analyze individual fires and to develop mathematical models expressing the effects of various measurable factors on the growth in size of a forest fire. Eventual objectives will be to define guidelines which might be used by dispatchers and fire managers to more effectively and economically control forest fires at small acreages.

Another research specialist began exploring the feasibility of reducing the number of Class D and E fires in the Division's Central Sierra District through hazard reduction in key areas. The preliminary study was to establish some approximate magnitudes as to the physical size of a hazard reduction project, costs of such a project, and the measures required in conducting it. If hazard reduction appears to be a promising approach to California's forest fire problem and within

the realm of economic possibility, a more thorough analysis will be undertaken. Unfortunately, the individual whose education, training, and experience particularly made him suitable for the study was recalled by the U. S. Army. It is hoped that the study will be resumed by the same person in about a year's time.

E. Fire Weather

1) Fire Danger Rating

A major addition was made to the Fire Danger Rating system in 1961 in the form of two new Danger Indexes and two methods of treatment of one of them. The existing Burning Index has been complemented by the Ignition Index and the Fire Load Index. The Ignition Index is a relative measure of the chance of a small firebrand starting a fire. It is based on temperature and the relative moisture content of fine dead fuels. The Fire Load Index measures the potential fire control load for a management area. In California the management area is the Fire Danger Rating area. Fire Load Index is based on the relationship of the Burning Index and the Ignition Index.

The Fire Load Index is accumulated each day into a Seasonal Severity Index which can be compared at any time with a "normal" Seasonal Severity accumulation derived from long term weather records. In addition, a Departure From Normal of Fire Load Index can be computed each ten days, or "Decade", by using a "normal" decade Fire Load Index as the reference. The Departure From Normal of Fire Load Index can be likened to departures from normal of temperature which is a commonly used term.

1960 weather records were again carefully checked in 1961 prior to entry on punch cards. Approximately 25,000 days of weather were recorded at CDF and Contract County stations. The high speed

computer program suffered several delays and setbacks. For various reasons the UNIVAC 1180 computer program was dropped. Instead, a programmer was employed by the Pacific Southwest Forest and Range Experiment Station to write the weather program for the IBM 704 computer. By the end of the year quite a bit of progress had been made and some short production runs had been completed on the University of California's 704 machine. Part of the program includes backdating data as far back as 1952. It is expected that data from over 500,000 punch cards will eventually be included in the program. A great amount of useful climatological data will be made available by the machine processing program. One of the prime goals of the program is the establishment of sound, long-term normals of all the Fire Danger Indexes for every FDR area in the state.

Field work continued through the medium of weather station inspections coupled with training and discussion of the operations of the FDR system. The greatest effort was expended in the northern part of the state with all stations in Humboldt, Siskiyou, Lassen, Shasta, Tehama, and Butte counties receiving a field inspection. Some work was also undertaken in other areas, particularly in Los Angeles County.

A major revision of the instruction handbooks pertaining to the FDR system was begun in late 1961. All material relative to the operations of the FDR system and operational weather will be gathered under one cover. The name of the FDR system was officially changed from "California Fire Danger Rating" to "Wildland Fire Danger Rating." A great deal of work remains to be done but the new FDR handbook is expected to be ready for the field by the spring of 1962.

Along with the handbook revision many operational details relating to the field set-up of the system were being revised, based on problems that have occurred and broader experience by field personnel in use of the system. Every effort was being made to streamline the field work and to cut the paperwork down to a minimum.

An innovation in the FDR system in 1961 was the establishment of a statewide net of "Yearlong" Fire Danger Rating stations. These stations, operated by federal, state, and county fire control agencies, will provide a skeleton sampling of Fire Danger for the purpose of measuring "off-season" Fire Weather Severity. In addition, they will begin building history of FDR indexes leading to the establishment of a system of yearlong normals of Seasonal Severity.

2) Fire Weather Forecasting

During 1961 there was little change in the procedures of the U. S. Weather Bureau fire weather forecasting, probably in anticipation of the first phase of the National Fire Weather Forecasting plan which is scheduled to begin operating in 1962. Some preliminary steps in the Plan took place during the year as fire weather in the Weather Bureau was recognized as a year-round activity. As a result of this recognition, the Redding Fire Weather office was activated as a permanent year-long installation. For the first time the Redding and San Francisco Fire Weather Supervisors will not be diverted to other Weather Bureau activities at the end of the fire season but will be able to devote undivided attention to fire weather problems in the same manner as has the Los Angeles center in the past.

By the end of the year the staffs at both Los Angeles and San Francisco were increased by one additional full time meteorologist. Also, vacancy bids were published for the fire weather forecaster positions at Fresno and Sacramento.

Of great importance to the Division was the filling, in March, of the position of Meteorologist II in the Sacramento Fire Control office. This position brings to the staff of the State Forester a fully qualified professional meteorologist who will have many responsibilities in the future development of the Division's fire weather program. In general, this position will serve as the coordinator of the Division's operations with the government weather services. Of no less importance is the field of consultation and expert advice relating to normal every-day operations with respect to weather. Many other phases of the CDF operations, such as law enforcement, construction, and public relations, will benefit by the availability of the meteorologist. Among the more immediate projects being undertaken by this position are the planning of a network of automatic weather reporting stations and assistance in the pure weather phase of the Fire Danger Rating system.

3) Fire Weather Instruments

Not too much progress has been made in the development of instruments. The wind counter construction program has continued but several problems in field operations have been encountered. Sufficient completed counters or the individual parts are now on hand to completely equip all CDF weather stations. Until the bugs in the current field units are straightened out this project will be deferred.

Some minor refinements were noted in the Xerometer but no extensive field trials were made of the instrument. Of interest

is the use of this instrument in an automatic weather reporting station where it operates in place of a standard relative humidity measuring device. One of the major advantages of the Xerometer is that the moisture sensing element translates relative moisture directly into a rotational movement which in turn can be read directly on a dial.

4) Radar and Thunderstorms

Work continued with the Sacramento Weather Bureau office and their WSR-57 Radar. This radar is specially designed for observing the various forms of precipitation. The maximum range is about 250 miles but the optimum range is nearer 150 miles at a maximum power output of 500,000 watts. Thunderstorm cells, or "echoes", can be located and measured and their movement plotted through the use of the radar.

Most effort was spent on refining the operational procedures to provide fast reliable reporting to the field of location and movement of thunderstorms. Considerable field reporting was made back to the radar unit for the purpose of correlating field conditions with radar scope measurements and echo characteristics.

It is expected that the meteorologist will be of great assistance in evaluating and improving the program, particularly with respect to field usage of the echo plots. The Radar staff is now in a position, after several seasons of experience, to begin preparation of summaries, reports, and analyses of the thunderstorm situations in northern California during the summer months. A major field which should be explored is that of the relation of radar echo characteristics to the prevailing synoptic pattern and extrapolation of the relationship to forecast the duration, intensity, and probable coverage of areas by the thunderstorm activity.

The year saw an above normal amount of thunderstorm activity which had some peculiar end results. Oddly enough, the total number of lightning fires on CDF protection areas were only about 9% above the 1956-1960 average and quite a bit less than in 1960. However, there seemed to be a greater tendency for "wet" thunderstorms to occur which apparently squelched many strikes before a fire could gain a toehold. One memorable outbreak of thunderstorms in particular covered the state from Lake Tahoe northward. The radar echoes were very strong and numerous. Some echo tops were measured at over 45,000 feet which is about the highest ever seen on the Sacramento radar set. Field reports indicated a tremendous amount of lightning activity with some areas reporting cloud to ground strikes every twenty seconds. One station reported 17 lightning bolts in one minute. Yet this storm was very wet and the actual number of confirmed fires was quite low. This pattern was noted in several of the other thunderstorm outbreaks. Only a very few lightning caused fires became any size or problem in 1961.

5) Fire Climate

The Division continued to contract funds to the Pacific Southwest Forest and Range Experiment Station for cooperative fire climate studies. The objectives of this program are to study fire behavior and to relate the effects of meteorological and associated fuel factors on fire behavior.

Analysis continued of past meteorological data gathered in the De Luz Canyon area of San Diego County, and in the Arroyo Seco Canyon and Mt. Baldy areas in Los Angeles County. Further meteorological and fuel data were gathered and analyzed in the Salyer area on the Six Rivers National Forest.

Principal efforts in 1961 were directed toward attempting to define the wind, temperature, and humidity patterns existing during the summer months in Fire Danger Rating Area No. 175, located generally in portions of Napa and Lake Counties. Specific objectives were:

- (1) To determine under what conditions and by what route marine air moves into the southeastern portion of FDR Area 175 following a period of high temperatures.
- (2) To determine if down-canyon afternoon winds occur in east-facing canyons in the area, and if their occurrence is related to the height and strength of the marine invasion.

Weather forecasting in FDR Area 175 has always been difficult because of the topographic complexities and the proximity of the area both to the dry, hot air of the Sacramento Valley and to the moist, cool air of the Pacific Ocean. Often, following a particularly hot spell, cool marine air will invade the large interior valleys through the Golden Gate, reaching as far north as Red Bluff. Many times, however, there is a definite lag in this cool air reaching certain smaller, isolated valleys in the coast ranges in Napa and Lake Counties. When the weather change does finally occur in these latter areas, it may do so rather suddenly, accompanied by erratic and "unusual" winds. Fire control efforts are often considerably hampered by these erratic winds and by weather forecasts which may not reflect true conditions.

Initial analysis of the data obtained in the summer of 1961 showed that extremely strong and erratic winds occur in the passes of the coast range, that down-canyon afternoon winds on east-facing slopes are not unusual and can become quite strong, and that these patterns can possibly be related to the height and

strength of the marine air invasion in much the same manner as was noted in the De Luz Canyon survey.

The U. S. Weather Bureau at San Francisco also cooperated in this study by observing the invasion of the Bay Area by fog following hot spells. Time lapse motion pictures were taken from various points in the Bay Area, principally from Mt. Tamalpais. The films showed several very interesting phenomena related to flow patterns of the stratus clouds, things that are not discernible without the aid of time lapse pictures. Only a limited amount of film was exposed in 1961, but it led to the development of techniques and denoted leads for further study which will take place during the summer of 1962.

3. IMPORTANT CHANGES IN PROTECTION PLANS,
ADDITION OF PERMANENT PERSONNEL, ETC.

A. Fire Plan Revision

The Red Mountain Lookout in Del Norte County was proposed as a part of the 1956 Fire Plan Revision. During 1961 the Division received budgetary approval to man this facility which is included within the Crescent City Assistant Ranger District of the Humboldt Ranger Unit. Previous to the 1961 fire season, the lookout was manned by personnel of the Six Rivers National Forest.

B. Training

Several significant changes occurred in the Division's training program during 1961. The Training Centers trained 160 Forest Fire Truck Drivers during the 1960-61 fiscal year; 110 drivers resigned during the period; 42 were promoted, so that at the end of the year the net gain of trained drivers was 8 men. The increase in number of seasonal Forest Fire Truck Driver positions resulting from the work-week modification contributed significantly to the high turnover rate of personnel in this class. The increased use of seasonal Forest Fire

Truck Drivers will create special training problems of a seasonal nature in succeeding years.

This problem was met in two ways during the 1961-62 fiscal year:

1. The number of driver graduates from the Centers was increased from 160 to 194 per year. No further increase can be made without increased physical plants and instructor staffs.
2. Forest Fire Truck Driver schools of 5 to 10 days in length will be offered at the District level for orientation and driver training to meet the needs of seasonal employees in the spring of 1962.

A new cooperative effort was undertaken by the Division with the Department of Corrections in the establishment of the Southern California Conservation Training Unit with the California Institution for Men at Chino in July 1961. The objective of this unit was two fold:

1. To teach inmates fire control methods, develop skill in the use of tools, and instruct in various work skills required in conservation project work.
2. To utilize experienced Forestry instructors to help in evaluating the inmate's readiness for camp assignment.

Results of the first six months of this operation indicate that significant benefits from the program can be expected in the form of lower inmate escape rates from Conservation Camps, reduction from time required to fit new inmates into camp crews, increased crew effectiveness and safety. A similar program will be established on a larger scale in the new Lassen Conservation Center in July 1962 as another cooperative effort of the two agencies.

The planned use of Conservation Camp crews to aid in flood control work as part of a cooperative program between the Division of Forestry

and the Department of Water Resources necessitated a new training program in the fall of 1961. Some 225 permanent Division of Forestry employees and 1650 inmates in the Conservation Camps in central and northern California were given an eight-hour course in flood fighting techniques and procedures by personnel of the Department of Water Resources. This type of training will be included as part of the annual inservice training for inmates at the Conservation Centers and Camps.

Persons interested in detailed information concerning the operation of the Division's Training Centers should read the Administrative Report, "Your Training Center, Its Work and Its Purpose", prepared by the Central Sierra Training Center staff in 1961.

Perhaps the most significant training improvement on the horizon is the use of programmed instruction by the Division. The first "programmed instruction text" used by the Division was developed and tested at the Central Sierra Training Center during the fall of 1961 by Associate Ranger Nixon. Program instruction appears to offer an economical method of providing individualized yet standardized instruction to Division personnel scattered the length and breadth of the State. Additional development in this area is contemplated in 1962.

C. Conservation Camp Program

The California Conservation Camp Program in which selected wards of the Department of the Youth Authority and inmates of the Department of Corrections are employed on conservation projects under supervision of the California Division of Forestry continued to expand in 1961.

Alder Conservation Camp near Klamath in Del Norte County, a current standard 80-man camp, was opened on March 18, 1961.

Washington Ridge Youth Conservation Camp near Nevada City, built to accommodate 80 wards in structures patterned after the Mt. Bullion Youth Conservation Camp design, was completed and first occupied on

September 11, 1961.

Adjustments were made in the total population by the elimination (with three exceptions noted below) of "temporary increases" which had resulted in some uncomfortable overcrowding made necessary by the expansion of the program in 1959. Magalia Conservation Camp in Butte County, built in 1949 to accommodate 60 inmates remains at 80 with provision being made for a permanent expansion to this capacity in the near future.

Vallecito Conservation Camp near Angels Camp in Calaveras County continues to maintain a temporary population of 100, 20 over the normal capacity. Oak Glen Conservation Camp near Beaumont in Riverside County remains at 80, although designed to accommodate a 60-man work force. All other camps at the end of 1961 were at their normal population level, as originally designed or modified. There were, operated jointly by the Division of Forestry:

In cooperation with the Department of Corrections:

21 permanent Conservation Camps with 1620 inmates

3 mobile Conservation Camps with 120 inmates

In cooperation with the Department of Youth Authority:

4 permanent Youth Conservation Camps 285 wards

3 spike Youth Conservation Camps 60 wards

31 ---Totals--- 2085

Conservation camps under construction to provide for the continued expansion of the program include the following: Intermountain, in Lassen County, where construction of camp buildings was completed late in December, 1961, in preparation for opening in 1962. Deadwood, near Fort Jones in Siskiyou County, where construction continues on schedule which should permit opening the new camp prior to the 1962 fire season.

Antelope, which will be the first of its kind, is being built into and will operate as a part of the Conservation Center under construction near Susanville in Lassen County. The Forestry Superintendent position has been filled to develop an adequate work program and direct the procurement of equipment, tools and supplies necessary for the operation of the forestry program undertaken by Antelope Conservation Camp which is scheduled for activation late in 1962.

Acquisition continues on sites for the Konocti Conservation Camp near Lower Lake in Lake County, Mono-Inyo Conservation Camp near Bishop in Inyo County, Black Mountain Conservation Camp near Cazadero in Sonoma County, and Cuesta Conservation Camp, a special arrangement which will permit the Division to work an 80-inmate complement directly out of the Correctional Institution known as "Men's Colony" at Los Padres in San Luis Obispo County. The Division is in the process of leasing buildings and space at the now inactive U. S. Army Camp San Luis Obispo to provide office, warehouse, shop and vehicle storage for the various functions associated with the Forestry Work Program.

The three 40-man mobile camps remained at the same locations during 1961; one at the future site of the Konocti Camp, one on the grounds at Deadwood Camp, and one near California Hot Springs in Tulare County.

D. Personnel Changes

Sacramento Administration:

An additional 10 man-months of temporary clerical help were added to cover increased workload in all sections.

District Headquarters:

One Assistant Forest Technician and 1.7 man-months of Forest Fire-fighter has been discontinued because of a shift in the Range Improvement program from District level to Ranger Unit level in District III

(Central Sierra District) to be performed by existing ranger unit personnel.

Field Services:

Fire crew group personnel were augmented by 15% to permit reduction in the length of the duty week from 120 hours to 104 hours during the fire season as declared by the State Forester. The increase in personnel by class is as follows:

Forest Firefighter Foreman	60
Forestry Equipment Operator	16
Forest Fire Truck Driver	25
Forest Firefighter	43

The Division assumed responsibility for fire control operations in San Mateo County effective January 1, 1962. Forty additional positions were provided for staffing initial attack, winter work and county contract operations:

Forester and Fire Warden	1
Assistant Forester and Fire Warden	3
Fire Station Supervisor	6
Forestry Equipment Operator - Mechanic	2
Fire Equipment Operator	19
Fireman	5
Camp Crew Cook	3
Intermediate Typist	1

Conservation Camps:

Activation of two new Conservation Camps required the addition of new personnel as follows:

Forestry Superintendent	2
Assistant Forestry Superintendent	2
Forestry Work Project Foreman	16
Forestry Equipment Operator	2

Activation of the Southern California Conservation Training Center at Chino required the addition of two new positions as Assistant Forestry Superintendent to furnish instructor services in forestry subjects.

The Division's fire suppression strength for the 1961-62 fiscal year compared to the 1960-61 fiscal year is as follows:

Class	Yearlong Employees	
	1960-61	1961-62
Forestry Work Project Foreman	222	238
Forest Firefighter Foreman:		
Crew Foreman	345	402
Patrol Foreman	35	35
Relief Dispatcher-Warehouseman	16	16
(Ranger Units)		
Relief Dispatcher	2	3
(Dist. I; Dist. II; Dist. VI)		
Forest Fire Truck Driver	247	249
	(72 County Contract during winter)	(81 County Contract during winter)
Forestry Equipment Operator:		
Initial Attack Bulldozer Operators	110	126
Assigned to Conservation Camp	29	31

For comparative purposes with other states, the Division of Forestry top pay grades (maximum after four years service) now are:

Number	Civil Service Title	Monthly Salary
1	State Forester	\$ 1,338
1	Chief Deputy State Forester	1,213
11	Deputy State Forester	1,048
13	Assistant Deputy State Forester	905
10	State Forest Ranger III	905
11	State Forest Ranger II	821
1	Forester and Fire Warden, San Mateo County	745
36	State Forest Ranger I	745
50	Associate State Forest Ranger	710
3	Assistant Forester and Fire Warden, San Mateo County	644
177	Assistant State Forest Ranger	644
12	Forestry Trainee (3-step range)	530
1	Meteorologist II	862
8	Senior Forest Technician	821
30	Forest Technician	745
14	Assistant Forest Technician	644
1	Law Enforcement Coordinator	905
2	Supervisor of Conservation Education	782
7	Forest Fire Prevention Officer	745
2	Associate Civil Engineer	862
18	Assistant Civil Engineer	745
2	Junior Civil Engineer	584
1	Assistant Mechanical Engineer	710
1	Architectural Associate	821
1	Associate Equipment Engineer	862
3	Forestry Equipment Engineer	821

<u>Number</u>	<u>Civil Service Title</u>	<u>Monthly Salary</u>
32	Forestry Superintendent, Conservation Camp	\$ 710
33	Assistant Forestry Superintendent, Conservation Camp	644
238	Forestry Work Project Foreman	613
3	Forest Fire Dispatcher	556
456	Forest Firefighter Foreman	556
6	Fire Station Supervisor, San Mateo County	584
157	Forestry Equipment Operator (3-step range)	556
2	Forestry Equipment Operator-Mechanic, San Mateo County	556
340	Forest Fire Truck Driver (4-step range) (249 yearlong)	481
19	Fire Equipment Operator, San Mateo County	481
5	Fireman, San Mateo County	415
927	Forest Firefighter (seasonal only)	376
105	Forest Fire Lookout (seasonal only)	395
185	Camp Crew Cook (28 yearlong)	415

4. FIRE EQUIPMENT AND IMPROVEMENTS:

A. Equipment

1. Inventory

During 1961 the Division had in operation the following equipment: (**)

<u>Transportation</u>		<u>Fire-fighting Equipment</u>		<u>Construction and Maintenance Equipment</u>	
Sedans	143	Pumpers:		Maintainers (Graders)	29
Station Wagons & Suburbans	71	Firetrucks FWD	165	Dump Trucks	44
Panels	22	Firetrucks Conv.	239	Cement Mixers	44
Pickups	196	Pickup Pumpers	43	Compressor Trucks	2
Stakesides	187	Bulldozers:		Compressor Trailers	33
Jeeps	60	Large	53	End Loaders	15
Buses	56	Medium	36	Miscellaneous	40
		Transports:		Fork Lifts	24
		Large	30	Semi-Trailers	32
		Medium	36		
		Misc. Equipment:		3 Mobile Units consisting	
		Wheel Tractors	4	of 15 Trailers each.	
		Discs	12	Also, each Unit has 2	
		Small Tractors	3	House Trailers	
		W/plow	1		
		House Trailers	19		
		Various	27		
		Special Service	49		
		Miscellaneous	31		
		Semi-Tank Trlrs.	30		
		Water-Tank Trlrs.	6		
		(approx. 400 gal.)			

** Up to July 1, 1962 - end of present Fiscal Year.

During 1961 (61-62 F.Y.) the following vehicles were received and placed in service:

		<u>Camp Expansion</u>	
Sedans	17	Sedans	3
Pickups	37	Pickups	3
Stakesides	19	Stakesides	3
Firetrucks FWD	15	Tractors	3
Firetrucks Conv.	17	Transports	2
Tractors	8	Trailers (Tilt Bed)	2
Transports (Large)	2	Suburbans	2
Panels	4	Dump Trucks	3
Pickup Pumpers	2	Cement Mixers	1
Station Wagons		B.D. Service Units	3
& Suburbans	5	End Loaders	1
Dump Trucks	8	Buses	9
Concrete Mixers	1	House Trailers	3
B.D. Service Units	9	Graders	1
End Loaders	1		
Buses	12		
House Trailers	3		
Motor Graders	1		
Tilt-Bed Trailers	2		

2. Equipment Development

The eighteen heat resistant, personnel protection blankets referred to in last year's report were distributed to the field, and reports indicate they were used in at least three instances in which a number of people were saved from possible severe burns. Present plans are to adopt the blanket as standard equipment on all fire control bulldozers with better than half of the fleet to be equipped prior to the 1962 season.

The "Forest Fire Hydraulics Slide Rule" developed last year has received wide acceptance by field people and is being given to each individual participating in hydraulics training sessions or upon graduation from one of the Driver or Foreman classes at the Training Centers. The rule is now available from a forest fire equipment supplier.

The abrasive resistant fire retardant pump designed and built at the Davis Shops has proven to be quite successful. Over a million gallons of fire retardant was transferred from mixer to

storage tanks during the season without a failure. Plans are to continue to build additional pumps as funds and manpower permit.

A Fire Camp Range Trailer was designed and built by District I during the early part of last year for feeding of large crews. It received its "Baptism" several times during the 1961 season, and except for a few minor changes, it appears as if this is the answer to the problem of cooking for the many men involved on campaign fires.

B. Improvements

1. Structures

There were three major construction projects completed during the 1961 calendar year, one employee trailer park, and an addition to one district office building. In all, there were thirty separate building projects.

a. Complete Conservation Camps (adult) at Alder Conservation Camp, Del Norte County; and at Don Lugo Conservation Camp, Riverside County with the following building complements:

1. 80 man barracks with recreation room
2. 2 combination staff office and barracks building
3. 100 man kitchen and messhall combination
4. 11 stall equipment storage buildings
5. Combination shop and warehouse
6. Gas and oil house
7. Dynamite storage vault
8. 2 residences with 2 garages (Alder only)

Plus site development including completion of water systems (1000 foot lift water system at Alder) and sanitation systems.

b. Washington Ridge Youth Conservation Camp, Nevada County, with the following building complement:

1. 80 ward barracks, laundry and game room combination building.
2. Combination two story staff dormitory and single story staff office building.
3. Combination messhall, recreation and hobbies building.
4. Emergency generator and main service panel building.
5. Gas and oil building.
6. Combination shop and 10 stall equipment storage and 1 stall repair room.

7. Warehouse
8. Water storage and treatment building.
9. 2 residences and 2 stall garages

Plus site development including water and sanitation systems.

- c. Forest Fire Station--New facility at Bailey Ridge, Calaveras County.
 1. Combination 6 man barracks and messhall building.
- d. Combination barracks, office with cooking facility.
 1. Latour State Forest, Lassen County.
- e. Office Buildings - Addition.
 1. District I Headquarters, Santa Rosa, Sonoma County, 1,930 square feet.
 2. Sonoma Ranger Unit Headquarters, Santa Rosa, Sonoma County, 582 square feet.
- f. Barracks (26 man) and Messhall (40 man) replacement plus all utilities, water distribution, sewage distribution and lift station disposal system, electric service and distribution and natural gas distribution.
 1. Oroville, Ranger Unit Headquarters, Butte County.
- g. Barracks - Addition
 1. High Rock Conservation Camp, Humboldt County, 1688 square feet.
- h. Messhall - Addition
 1. High Rock Conservation Camp, Humboldt County, 886 square feet.
- i. Nursery Tree Packing and Cold Storage Building
 1. Magalia Conservation Camp, Butte County.
- j. Nursery Seed Building Addition for walk-in refrigerator (527 square feet)
 1. Davis Nursery
- k. Residence (1,357 square feet) and Garage (484 square feet)
 1. Boonville Forest Fire Station, Mendocino County
 2. Cathay Forest Fire Station, Mariposa County
- l. Residence - one bedroom addition
 1. Mariposa Forest Fire Station, Mariposa County

m. Gas and Oil Building

1. Riverside Ranger Unit Headquarters, Riverside County
2. Ogo Forest Fire Station, Shasta County

n. Radio Service Shop

1. Susanville Ranger Unit Headquarters, Lassen County

o. Equipment Building, 2 Bay

1. Buckhorn Forest Fire Station, Shasta County

p. Lookout Tower, 30 feet high

1. Red Mountain Lookout, Del Norte County, Humboldt Ranger Unit.

q. Lookout Cab Modification to sliding windows and addition of catwalks.

1. Banner Mountain, Placer County
2. Blue Ridge, Tulare County

r. Four Pole Antenna Tower

1. Cahto Radio Repeater Vault, Mendocino County

s. Recreation Building - Addition

1. High Rock Conservation Camp, 480 square feet, Humboldt County
2. Iron Mine Conservation Camp, 500 square feet, Placer County
3. Miramonte Conservation Camp, 480 square feet, Fresno County

t. Radio Repeater Vault, two 16 place vaults with generator building.

1. Banner Mountain Lookout, Placer County
2. Mt. St. Helena, Radio Repeater Vault, Napa County and one 5 place vault with generator building.
3. Siegler Mountain, Radio Repeater Vault, Lake County.

u. Trailer Parking Camp - 4 spaces with all utilities.

1. Chamberlain Creek Conservation Camp

2. Water and Sanitation Development

a. Jackson State Forest - Steel Forms for 10,000 gallon concrete tanks, Mendocino County

b. 10,000 gallon concrete tanks using steel forms at
Pisgah Peak Tank, San Bernardino County
Summit Tank, San Bernardino County

Magee Truck Trail Tank, San Diego County
North Mountain Tank, Riverside County
Tecate Lookout Tank, San Diego County

- c. Coulterville Forest Fire Station, water well, pipe line, pump and pressure system, Mariposa County
- d. Santa Margarita Forest Fire Station, water well, San Luis Obispo County
- e. Buckhorn Forest Fire Station, Well House, Shasta County
- f. Grasshopper Forest Fire Station, Pump House, Lassen County
- g. Bridgeville Forest Fire Station, Pump house and water system
- h. Iron Mine Conservation Camp, Water Treatment Building and two 15,000 gallon concrete storage tanks, Placer County
- i. Arnold Forest Fire Station, Well, Calaveras County
- j. Groveland Forest Fire Station, Deepened existing well, Tuolumne County
- k. Intermountain Conservation Camp, purchased, cleaned and cased an old well, Lassen County
- l. Ben Lomond Youth Conservation Camp, enlarged nursery pump system and brought in new heavier electric service, Santa Cruz County.
- m. Deadwood Conservation Camp, Water Well, Siskiyou County
- n. Hornitos Forest Fire Station, Water Well, Mariposa County
- o. Healdsburg Forest Fire Station, Install water pump, Sonoma County
- p. Forest Ranch Forest Fire Station, Drill water well, Butte County
- q. Washington Ridge Youth Conservation Camp, Water Well, Nevada County
- r. Mt. Zion Forest Fire Station, Deepen Water Well, Amador County
- s. Shady Creek Forest Fire Station, Case a dug well and set new pump, Nevada County
- t. Cathay Forest Fire Station, Water Well, Mariposa County
- u. Coarsegold Youth Conservation Camp, Spike Camp, New 3,000 gallon water tank, Madera County
- v. Alder Conservation Camp, In camp water storage tanks and booster pump - pressure tank water system, Del Norte County

- w. Miramonte Conservation Camp, sewage oxidation ponds, and new water well, Fresno County
- x. Morena Conservation Camp, sewage oxidations - leaching ponds, San Diego County
- y. Carmel Forest Fire Station, Sewage leaching pit, Monterey County
- z. San Luis Obispo, Ranger Unit Headquarters, Sewer line to connect to city sewer, San Luis Obispo County
- aa. Ramona Air Attack Base, sewage septic tank system, San Diego County.

3. Bridges

DISTRICT	I		II		III		IV		V		VI		TOTAL	
Class	No.	Lin. Ft.	No.	Lin. Ft.	No.	Lin. Ft.	No.	Lin. Ft.	No.	Lin. Ft.	No.	Lin. Ft.	No.	Lin. Ft.
A (Suspension)	0	0	0	0	1	270	0	0	0	0	0	0	1	270
B (Steel Beam)	1	38	7	471	4	182	0	0	0	0	0	0	12	691
C (Timber Span)	7	212	9	191	0	0	1	14	2	90	1	16	20	523
D (Conc. Slab)	1	39	0	0	7	88	0	0	0	0	0	0	8	127
E (Log Span)	4	111	4	131	1	15	0	0	0	0	0	0	9	257
F (Steel Truss)	0	0	7	788	5	881	0	0	1	70	0	0	13	1739

Horse Creek Bridge #46F2 in District IV was abandoned in favor of a relocated crossing using a culvert and paved overflow.

4. Telephone Lines

<u>DISTRICT</u>	<u>GROUND TREE & POLE</u>	<u>METALLIC</u>
I	165	109.75
II	214.2	385.4
III	0	542.25
IV	16	219.25
V	75	163
VI	0	62.3
Total	470.2	1,481.95

The decrease of some 29 miles of metallic line in District II largely due to removal of lines in the proposed Oroville reservoir area. Other reduction in line lengths have been mainly due to the impact of urbanization.

5. Power Lines

District I	7.5 miles
District II	2.0 miles
District III	.6 miles
District IV	<u>4.0 miles</u>
TOTAL	14.1 miles

6. Roads

The decrease of 1.9 miles in this report over last year's report reflects changes occurring statewide and are broken down by districts below, showing amount of change and reason for change.

District I	increase of 4.0 miles	new construction
District II	increase of 15.5 miles	new construction
District III	increase of 20.4 miles	new construction
District IV	decrease of 4.0 miles	abandonment
District V	decrease of 22.2 miles	abandonment
District VI	decrease of 15.6 miles	abandonment

<u>District</u>	<u>Road Miles</u>
I	325.0
II	1130.7
III	481.4
IV	509.1
V	459.7
VI	<u>600.6</u>
TOTAL	3506.5

7. Land Transactions

Deeds Acquired:

Alderpoint - Humboldt County
 Arnolds - Calaveras County
 Cambria - San Luis Obispo County
 Crystal Creek Addition - Shasta County
 District IV Addition - Fresno County
 District V Headquarters - Monterey County
 Dobbins - Yuba County
 Magalia (1 acre portion only) - Butte County
 Shadequarter - Tulare County
 Temecula - Riverside County
 Walsh Mountain - Yuba County
 Yucca Valley - San Bernardino County

Leases:

District V Warehouse - Lease Extension
 Ryan Airport - 25 year lease
 Alturas Assistant Ranger Headquarters - 3 years

Leases (Cont)

Mustang Forest Fire Station - 1 year extension
Big Valley Mountain Repeater
Corning Forest Fire Station - 5 years
Plum Creek Conservation Camp - Transfer of Control and Possession
Chalks Mountain Repeater - 25 years
Three Sisters Repeater Site - 49 years
Siskiyou City Airport - 10 years
Oroville Airport
Crystal Creek Conservation Camp
Mt. Woodson Lookout - 5 years
Minnewawa Conservation Camp - 3 years

Use Permits:

Mountain Home Conservation Camp - Amendment to construct residences, garage, water tank sites and pipeline and right of way.

8. Maps

Two maps of the State of California were printed during the year. One is entitled Fire Protection Map by Agency and the other Division of Forestry Facilities. These maps are to the scale of 1 inch equals 16 miles. A new map of Kings Ranger Unit was also completed. Revisions were also made on Western and Central Riverside maps. A radio communication map was also prepared for use by the Division.

Numerous charts and special maps were prepared during the year for all sections in the Division and also for the Department of Conservation.

Considerable time was spent on land acquisition and road maintenance maps.

C. Radio

The California Division of Forestry has been utilizing radio as a means of communications since the early thirties; and from the start, its importance has been recognized and its use has spiralled with the ever-increasing complexity of fire control. Except for a slow

start in the early experimental stages and during the war years, the Division's Radio system has shown a steady increase in number and scope, until today it is operating over 2500 units, and is probably the largest system in the State of California, if not in the Nation.

Of these 2500 units, approximately 1400 are in mobile equipment, of which approximately 140 are county-owned. Also operated are 407 State-owned fixed base stations, of which 37 are in Dispatch Headquarters and 187 are in Forest Fire Stations. Twenty-four additional lookouts remotely control fixed mobile relays in order to have radio communications. Thirty-one Correctional Conservation Camps are equipped with radio base stations capable of operating both on the Local and on the State Fire Nets. The remaining units are of miscellaneous class, used in airports, cooperating agencies, weather bureau, etc. The Division has 700 portable units, of which 628 are of the handie-talkie type of equipment, and the remaining portable equipment used mostly in Emergency Fire Camp operation. Seventy-four mobile relays are operated by the Division, 48 of which are for local operation and the remaining 26 operating on the Statewide Fire Net. In addition, there are 12 remotely controlled Air Net base stations. Microwave is an integral part of the Division's radio system and its importance is being realized more each year. To control the radio system, Forestry has 44 microwave terminals in operation, and has many additional circuit miles on other agencies' equipment, which is all part of the State of California's Public Safety Services integrated microwave system.

On order, at the present time, are some 93 additional units, which should be delivered prior to the 1962 fire season. This will increase the units to approximately 2600.

The program of frequency changes, which has been in progress for the last four years, should be completed prior to July 1, 1962. With

the completion of this change-over, the Division of Forestry's radio system will be operating on 15 frequencies from the Forestry-Conservation band, and frequencies formerly used on loan from the U. S. Forest Service will be relinquished.

In November of 1961, a comprehensive report was completed relative to the Division's system. This report included the complete inventory of all equipment, and plans for the expansion and modification of its system to the year 1966.

5. FIRE PREVENTION

Forest fire prevention in California is approached through integrated mass media education, law enforcement, hazard reduction, and public relations programs. Each phase of the endeavor is influenced by efforts exerted in each of the other phases. This portion of this report will illustrate the wide range of activities credited to the Division of Forestry with emphasis on educational efforts. However, the California program is one of cooperation involving many other public and private organizations, making it almost impossible to segregate the activities of one from the rest. Therefore, many of the contributions credited below will have been those of the Division only in part.

Through the California Fire Prevention Committee, the State Forester and the Regional Forester of the Forest Service coordinate a State-wide mass media education program. This Committee has a membership of over four hundred of the State's leaders from industry, business, labor, utilities, transportation, indoor advertising, informational services, organizations, agriculture, military, and other governmental agencies and individuals. As members of this Committee and working cooperatively with protection agencies are the Redwood Region Conservation Council and Keep California Green, Inc. These privately supported organizations have

extensive forest fire prevention programs directed by full-time executives, supplementing the programs of public agencies. The Conservation Council of Southern California has an organized and planned forest fire prevention section. The San Francisco Chamber of Commerce has a "Keep Green" Committee dealing directly with forest fire prevention. There are several county agencies that direct planned programs which are coordinated with the statewide campaign.

Because the program involves so many people and organizations other than Division of Forestry personnel, this report will be divided into two parts; Part I will deal with Division of Forestry field personnel activities and Part II will treat the Statewide Cooperative Mass Media Education Program.

1. Division of Forestry Field Personnel Activities:

The statistics which follow are offered to indicate the concerted effort directed toward the prevention of forest fires and to show the scope of these activities by field personnel. These activities are in addition to those listed under part II of this report.

A. Newspaper Publicity

1. Made 10,573 contacts with the press which resulted in editorials, fire news, and other prevention copy.
2. Made 1,924 news releases.
3. Made 139 contacts with press which resulted in 87 drop ins and 52 sponsored advertisements.

B. Radio Publicity

1. Participated in 369 radio presentations (talks, interviews, and programs).
2. Presented material for 2,272 short announcements.

B-1. Television Publicity

1. Participated in 34 TV presentations (talks, interviews, and programs).
2. Presented material for 684 TV short announcements.

C. Visual Education

1. Distributed 3,293,000 pieces of printed material, including posters, leaflets, pamphlets, stickers, etc.
2. Arranged for 587 displays in store windows, theaters, and public buildings.
3. Made 1,611 postings on Division of Forestry 4' x 8' highway rights-of-way roadside signs.
4. Displayed 84 floats and/or equipment which were viewed by 384,275 people.
5. Made 58 exhibits at fairs which were viewed by 1,385,000.

D. Group Contacts

1. Presented 1,320 programs with and without films which were attended by 49,200 adults.
2. Presented 1,342 programs with and without films attended by 96,000 children.

E. Training

1. Held 3,806 training programs with an attendance of 29,924.

F. Personal Contacts

1. Made 234,500 personal contacts at fair booths and equipment exhibits.
2. Made 261,500 contacts during normal work day.
3. Made 104,021 personal contacts during 71,370 man hours spent on patrol duty.

G. Permits

1. Issued 102,650 regular burning permits.
2. Issued 324 range improvement permits.

H. Inspections (Zones I and II)

1. Sawmills - 750
2. Other Mills - 159
3. Logging Operation areas - 2,245
4. Industrial areas (other) - 915
5. Dumps (public and private) - 3,266
6. Public areas (recreational, school, etc.) - 3,636

7. Residential areas (farm and mountain) - 21,527
8. Mechanical equipment (farm, logging, construction, etc.) - 6,080

1. Hazard Reduction (Zones I and II)

Rights-of-way

1. State and county highways (disced, burned, or treated) - 503 miles
2. State and county highways (disced, burned, or treated in cooperation with others) - 281
3. State and county highways (disced, burned, or treated by others) - 927
4. Railroads fireproofed (cooperative) - 166 miles

The following statistical record lists, by per cent of total of man-caused fires, location, causal agents, and causes of forest fires occurring in the Division of Forestry's direct protection responsibility area (Zones I and II).

<u>Location</u>	<u>%</u>
Roadside	35.01
Logging and Lumbering Areas	1.45
Wildlands	38.53
Dooryards	12.27
Cultivated Areas	4.06
Railroads	4.22
Dumps	2.24
Miscellaneous	2.22

100.00

Causal Agents

Rancher-Farmer	8.48
Tenant	8.32
Children	15.38
Traveler	24.21
Commercial Transporter	.92
Forest Product Worker	2.31
Construction Worker	1.58
Hunter	6.60
Fisherman	.66
Recreationist	3.56
Tramp	.86
Railroad and Other Vehicles	7.98
Miscellaneous	18.74
Structural Agents	.40

100.00

<u>Causes</u>	<u>%</u>
Smoker-Matches-Tobacco	40.48
Debris Burning - (non-permit)	3.52
Debris Burning - Permit Escape (Land Clearing, incinerators, range improvement, trash burning)	9.93
Vehicle	8.42
Railroad - Mechanical	3.87
Incendiary	14.38
Logging Slash	.33
Sawmill Burner	.30
Power Line	3.16
Campfires	2.41
Blasting, spontaneous combustion, stationary engine, welding, structural	2.61
Miscellaneous	10.59
	100.00

11. State-wide Cooperative Mass Media Education Programs

These programs in California are directed primarily toward urban, suburban, out-of-State visitors and other transient users of wildland areas. However, a considerable amount of time and effort of field personnel carry the same type of program to local people, especially those in smaller cities and towns.

As mentioned above, the State Forester and the Regional Forester coordinate mass media efforts through the California Fire Prevention Committee. Over a period of years, staff personnel have been assigned to work with active and potential cooperators on a program directed toward acquainting them with their individual and organizational responsibility for the prevention of forest fires. The goal is to realize maximum use of all available facilities in an educational program. In assuming responsibility, it is not unusual for the cooperator to produce and distribute materials attendant to mass media programs. There is no possibility that these can be enumerated, but included are posters, leaflets, direct mail stuffers, features in press, house organs, training publications and other printed material. Motion picture features for television,

outdoor advertising space, drop-in ads, window displays, fair exhibits, merchandise displays, and many other media were utilized. Air time on radio and television, trailers in motion picture theaters, public address facilities on trains and aircraft, displays in public transportation equipment, displays on car and truck bumpers, signs on truck bodies, and others too numerous to mention here were put to work as a public service. Libraries and schools, youth groups, civic organizations, farm associations, water and soil districts, lumbering interests, and other organizations adopted forest fire prevention as an objective in public service.

In addition to activities of Division personnel listed in Part I, cooperative fair exhibits were prepared at the Los Angeles County Fair in Pomona, California State Fair in Sacramento, and at large association meetings in metropolitan areas which an estimated one million people viewed.

To service the many cooperators, the Division prepared and produced or purchased more than nine million pieces of material.

The Division continued with production of motion picture films for distribution to television stations, motion picture theaters, and other public showings.

Suggested radio spot announcements and other materials were provided to all radio stations.

Two or more spots were supplied each week for over a seven-months period.

Portable fair exhibits were provided for use by field personnel and cooperators.

Information

During the past year contacts with all news media were increased. While the California Division of Forestry has not employed information

officers, an increased news consciousness on the part of most supervisors encouraged media initiated contacts.

On all major forest fires or multiple fire situations, the fire line position of public information officer was activated. This reduced pressures on fire bosses and insured that complete, accurate information was made available to the public.

Forest fire news stimulated an interest in other aspects of conservation so that reporters and editors recognized news value in other aspects of natural resources.

Each function in the Division is being encouraged to recognize the public educational values of its activities and to cooperate with all news media in making wildland protection and development information available to the public.

6. LAW ENFORCEMENT

Associated with the increase in total numbers of fires in 1961, were proportionate increases in law violations that resulted in fire occurrence. Approximately 15% of the man-caused fires in 1961 were of incendiary origin. This is approximately a 5% higher figure than the 20-year average of 10%. Of the 76 major fires (Class E), 27 (36%) were caused by arsonists. These 27 fires burned over 125,000 acres with approximately three million dollars damage. Four wildland residents lost their lives in two of these incendiary fires. A total of 430 incendiary fires of all size classes, occurred in Zones I and II.

An accelerated program of criminal law enforcement evolved from the increase in fire law violations. A 20% increase in time and effort expended in this field is estimated for 1961.

Pre-fire season training in all of the aspects of criminal, civil, and administrative law enforcement received intensified effort throughout the Division.

The following statistical report indicates the action taken by the Division in law enforcement. These actions resulted following investigation of circumstances concerning each fire. No attempt has been made here to separate actions as to zones; therefore, this report covers Zones I, II, and III:

Criminal

Total investigations 11,647

Criminal cases:

Criminal court misdemeanor	232
Criminal court felony	23
Juvenile authority	41
District Attorney citation	28

Total 322

Fines levied	\$10,770.78
Fines collected	\$ 4,799.78
Average amount fine collected per case	\$ 31.90
Bail forfeited	\$ 445.75
Jail sentences served (total days)	605
Reparations ordered by court	\$ 1,734.91

Civil

Cases investigated for liability	3,021
Cases submitted for review or disposition	617
Amount involved in pending actions	\$349,437.99
Collected in 1961 on previously pending cases	\$15,956.49

7. INCREASES IN APPROPRIATIONS

<u>1960-61 Expenditures</u>	<u>Estimated 1960-61</u>	<u>Actual 1960-61</u>	<u>Change</u>
Support	\$ 18,201,176	\$ 17,380,588	\$ - 820,588
Other Current Expenditures	<u>3,591,387</u>	<u>3,417,655</u>	<u>- 173,732</u>
Total	\$ 21,792,563	\$ 20,798,243	\$ - 994,320
Capital Outlay	\$ 5,997,062	\$ 2,994,761	\$ - 3,002,301

<u>1961-62</u>	<u>Actual 1960-61</u>	<u>Estimated 1961-62</u>	<u>Change</u>
Support	\$ 17,380,588	\$ 18,738,676	\$ + 1,358,088
Other Current Expenditures	<u>3,417,655</u>	<u>4,286,434</u>	<u>+ 868,772</u>
Total	\$ 20,798,243	\$ 23,025,110	\$ + 2,226,867
Capital Outlay	\$ 2,994,761	\$ 5,707,596	\$ + 2,712,835

Support

1960-61

Actual Salaries and Wages were \$523,172 less than the estimated amount. The overall savings is approximately 3 per cent of the budgeted salaries. Savings can be attributed to the light Spring fire season.

Actual Operating Expenses were \$344,032 less than budgeted funds. The major portion of unexpended funds can be attributed to the light Spring fire season and the holding of expenditures to minimum needs to comply with directive from Department of Finance requesting an overall savings of 2.2 per cent.

Actual Equipment expenditures were \$48,995 less than budgeted funds. Sale prices of units being replaced were greater than anticipated resulting in certain savings in the equipment budget. Certain equipment was not purchased in order to comply with directive from Department of Finance requesting that a 2.2 per cent savings be made by each agency.

Reimbursements were \$95,611 less than budgeted. This represents a decrease of 2.5 percent of total budgeted reimbursements. Weather conditions prohibited the completion of certain inmate projects for other State Agencies with a resulting reduction in reimbursements.

1961-62

Estimated Salaries for 1961-62 exceed actual amount expended in 1960-61 by \$1,590,022. Increase can be attributed primarily to change in work week from 120 hours to 104 hours. This resulted in a substantial increase in personnel.

Estimated Operating Expenses are \$495,807 greater than expended in the 1960-61 Fiscal Year. The increase can be attributed to changes in Conservation Camp activations and forced savings in order to meet directive of Department of Finance.

Estimated Equipment expenditures are \$406,368 less than expended in the 1960-61 Fiscal Year. The major reduction is in radio as in the 1960-61 Fiscal Year the system was about brought up to the standard where it could be effectively utilized in the Civil Defense program. It has also been necessary to curtail purchase of some items to stay within the allocation granted by Department of Finance.

Reimbursements have increased \$321,375 over actual reimbursements for 1960-61. The major portion of the increase can be attributed to the change in work week from 120 hours to 104 hours. This resulted in a substantial increase in reimbursements from counties for fire protection under the County Cooperative Schedule A agreements.

Total estimated increase for Support in 1961-62 over 1960-61 is \$1,358,088.

Other Current Expenses

1960-61

Actual expenditures were \$173,732 less than budgeted funds. Unexpended funds can be attributed primarily to overall 2.2 per cent savings factor applied in accordance with Department of Finance directive. Also \$46,017 of allocation of \$410,000 from Governor's Emergency fund was unexpended in the Emergency Fire Suppression and Detection item.

1961-62

Other Current Expenses for 1961-62 are \$868,772 more than actual expenditures for the previous year. This can be attributed to an increase of anticipated expenditures of \$574,467 over budgeted Emergency Fire Suppression funds expended in the 1960-61 Fiscal Year. The remaining

difference primarily is the result of work week change from 120 hours to 104 hours which resulted in an appreciable increase in direct allotments to U. S. Forest Service and Cooperative Counties.

Capital Outlay and Savings

Capital Outlay funds are made available for a three year period and funds in preceding table represent only the fiscal status at the time of this report. The major portion of funds appropriated to this Division each fiscal year is being expended on new Conservation Camps.

8. LEGISLATION

No new legislation was enacted in 1960 which pertained to the fire control operations of the Division of Forestry.

9. PROGRESS MADE IN MEETING FIRE PROTECTION STANDARDS AND OBJECTIVES

Interrupting, it is to be hoped briefly, the steady decline noted in a previous report of forest fire damage on Clarke-McNary lands in California, the greatest burned acreage loss since the disastrous 1950 fire season was sustained during the 1961 season. The factors contributing to this sudden reversal of a downward trend have been noted elsewhere in this report and need not be repeated here.

There is satisfaction to be derived, however, from the equally incontrovertible fact that the thirteen year (1948-1960 incl.) downward trend in the incidence of man-caused fires was narrowly maintained in 1961 in spite of the mathematical increase of 189 fires over the previous year. This satisfaction is legitimately enhanced when the record of incidence during the over-all fourteen year period is correlated to population increase, and transformed to a ratio of fires per population unit. By this method of comparison it becomes evident that during that span of years, the numbers of forest fires per unit of resident population steadily dropped from just over 2.00 forest fires

for each 10,000 California residents to 1.1684 fires for like segments of the population at an annual average decrease of .0664 fires, or a total of .8632 fires during the fourteen year period for each 10,000 residents.

At the same time, in spite of the substantial increase in the average size of forest fires as shown in the accompanying table, there has been during the same fourteen year period a small but measurable decrease in the average size of forest fires at an annual rate of .433 acres, from a computed 62.8 acres in 1948 to a computed 57.2 acres per fire in 1961.

Reference to the citation of like measurements in our 1960 report will reveal that while the 1961 record greatly disturbed the rate of the downward trend in incidence and containment of fires on Clarke-McNary lands in California during the prior thirteen year period, it did not reverse those trends. Nor does it seem likely from an inspection of the long term record that any future fire season, short of a statewide disaster, will do so.

A condensed table illustrating how the continuing threat to California wildlands is being met and solved, is shown below:

California Clarke-McNary Lands

<u>Total Fires</u>	<u>Acres Burned</u>	<u>Acres per Fire</u>	<u>Annual Average % of C.M. Lands Burned</u>
<u>1952-56 Average</u>			
2,165	127,627	59	.64
<u>1957-61 Average</u>			
2,525	144,229	57	.73
<u>1961</u>			
2,631	212,641	81	1.07

10. COOPERATIVE AGREEMENTS FOR PROTECTION OF STATE AND PRIVATE LANDS

1. Clarke-McNary Land Protection

The State Forester contracts, by cooperative agreements, for the protection of Clarke-McNary lands with the U. S. Forest Service and the six contract counties of Kern, Los Angeles, Marin, San Mateo, Santa Barbara, and Ventura, as follows:

C-M Lands Protected by the State	13,399,235
C-M Lands Protected by the U.S. Forest Service	4,792,201
C-M Lands Protected by the Contract Counties	<u>1,618,555</u>
Total	19,809,991

2. Federal Lands Protected by the State

<u>Agency</u>	<u>Area-Acres</u>	<u>Method of Payment to State</u>
Bureau of Land Management		
Unappropriated Public Domain:		
Zone I	1,813,423	24c/acre/year
Zone II	507,056	24c/acre/year
Other	330,000	None
Grazing District Lands,		
Zones I, II and III	690,000	Fire Cost Reimbursement
U. S. Forest Service	386,623	
Bureau of Indian Affairs	265,293	Fire Cost Reimbursement
Other Government	<u>225,000</u>	None
Total	4,217,395	

3. Total Land Area Directly Protected by the State

- * Zone I and II 29,614,792 Acres
- ** Zone III (24 Counties) 6,038,118 Acres
- * All State, private and intermingled federal lands, which are directly protected by the State and are primary watershed or timber lands with contiguous secondary watershed and grazing lands. (13,399,235 acres are Clarke-McNary)
- ** Rural, agricultural, grazing and wildlands not qualifying as State responsibility but which are protected by the State on an actual presuppression cost basis reimbursed by the County concerned. Each county buys the protection desired.

11. NUMBER OF FOREST FIRE FATALITIES

One air tanker pilot was killed while engaged in dropping operations on a fire in the Butte Ranger Unit in District II.

12. NATURE AND EXTENT OF MILITARY COOPERATION

1. In Zone I, on 7 fires, 279 man hours were expended.
2. In Zone II, on 10 fires, 381 man hours were expended.
3. In Zone III, on 36 fires, 138 man hours were expended.
4. On 1 non-forest fire, 7 man hours were expended.

11. NUMBER OF FOREST FIRE FATALITIES/INJURIES FOR FISCAL YEAR 1961

One air tanker pilot was killed while engaged in forest fire fighting operations.

Personnel killed while engaged in forest fire fighting operations:

Forest Ranger, 1 killed while engaged in forest fire fighting operations.

12. NATIVE AND EXTENT OF MILITARY COOPERATION

Native and extent of military cooperation in forest fire fighting operations:

1. In Zone I, on 7 fires, 279 man hours were expended.	279
2. In Zone II, on 10 fires, 381 man hours were expended.	381
3. In Zone III, on 36 fires, 138 man hours were expended.	138
4. On 1 non-forest fire, 7 man hours were expended.	7
Total	805

2. Federal Lands Protected by the State

Agency	Area-Acres	Method of Payment to State
Bureau of Land Management		
Unappropriated Public Domain		
Zone I	1,813,423	24c/acre/year
Zone II	507,056	24c/acre/year
Other	730,000	None
Grazing District Lands		
Zones I, II and III	590,000	Fire Cost Reimbursement
U. S. Forest Service	186,623	
Bureau of Indian Affairs	155,253	Fire Cost Reimbursement
Other Agencies	225,000	None
Total	4,217,355	

3. Total Land Area Directly Protected by the State

- * Zone I and II 29,614,798 Acres
- ** Zone III (24 Counties) 6,038,118 Acres

* All State, private and intermingled Federal lands, which are directly protected by the State are included in the above figures. (Total acres 29,614,798)

** Lands, agencies, grazing and other lands not qualifying as State lands are included in the above figures. (Total acres 6,038,118)



